

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
31 March 2005 (31.03.2005)

PCT

(10) International Publication Number
WO 2005/029878 A3(51) International Patent Classification⁷: **H04B 7/15,**
H04Q 7/20(21) International Application Number:
PCT/US2004/030781(22) International Filing Date:
17 September 2004 (17.09.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/503,490 17 September 2003 (17.09.2003) US(71) Applicant (for all designated States except US): **ANDREW CORPORATION** [US/US]; 19700 Janelia Farm Boulevard, Ashburn, VA (US).

(72) Inventors; and

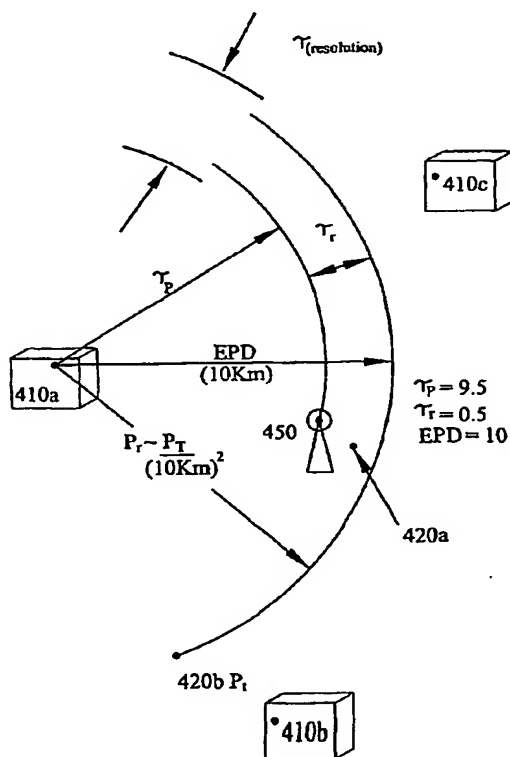
(75) Inventors/Applicants (for US only): **KENNEDY, Joseph, P., Jr.** [US/US]; 11127 Elmview Place, Great Falls, VA 22066 (US). **CARLSON, John, Peter** [US/US]; 12006 Trossack Road, Herndon, VA 20170 (US).**GRAVELY, Thomas, B.** [US/US]; 11693 Hanna Overlook Court, Herndon, VA 20170 (US). **BECK, Andrew** [US/US]; 21576 LeFevre Inn Drive, Ashburn, VA 20148 (US).(74) Agent: **COMTOIS, Mark, C.**; 1667 K Street, N.W., Suite 700, Washington, DC 20006 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: SYSTEM AND METHOD OF OPERATION FOR NETWORK OVERLAY GEOLOCATION SYSTEM WITH REPEATERS



(57) Abstract: A novel system and method for a network overlay geolocation system operating in a host wireless communication system with repeaters is disclosed. Embodiments of the novel system and method enable wireless communication system to determine if signals being received by system receivers arrive directly from a target mobile appliance or if the signals are passing through a repeater. The system's determination may be based at least in part on the TA of the signal, the power of the received signal, the power of the transmitted signal, the hearability of the signal at system receivers, the hearability of system transmitters at the mobile and the known delays associated with the repeaters. Embodiments of the novel system and method provide a more accurate geolocation of mobiles served by repeater stations than capable in the prior art.



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:
2 February 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/30781

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04B 7/15; H04Q 7/20

US CL : 455/11.1, 456.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 455/11.1, 456.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Eas**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0,083,008 A1 (Baker et al.) 1 May 2003 (01.05.2003), par.0008, lines 1-16; par.0026, lines 22; par.0027, lines 1-11.	1, 8, 19, 26, 27
Y	US 6,501,955 B1 (Durrant et al.) 31 Dec.2002 (31.12.2002), column 3, lines 1-33; column 4, lines 31-38, column 6, lines 45-67, column 7, lines 14-19.	1-3, 6,8, 13, 18-20, 23-25 and 27
Y	US 2003/0,162,550 A1 (Kuwahara et al.) 28 August 2003 (28.08.2003), par.0011, page 2, par. 0022, par. 0023, par. 0024.	1, 4,7, 16, 26
Y, T	US 2003/0,220,075 A1 (Baker et al.) 27 Nov. 2003 (27.11.2003), pages 2-5.	1, 8, 19, 26, 27
Y, T	US 2004/0,147,221 A1 (Sheynblat et al.) 29 Jul. 2004 (29.06.2004), pages 1-4	26-27

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

- Special categories of cited documents:

-A- document defining the general state of the art which is not considered to be of particular relevance

-E- earlier application or patent published on or after the international filing date

-L- document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

-O- document referring to an oral disclosure, use, exhibition or other means

-P- document published prior to the international filing date but later than the priority date claimed

-T- later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

-X- document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

-Y- document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

-&- document member of the same patent family

Date of the actual completion of the international search

07 December 2004 (07.12.2004)

Date of mailing of the international search report

08 NOV 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Angelica M. Perez

Telephone No. (703)305-8724